

# PATENT ABSTRACTS OF JAPAN

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(51)Int.Cl.

G02F 1/136

G02F 1/1343

(21)Application number : 05-065653

(71)Applicant : SHARP CORP

(22)Date of filing : 24.03.1993

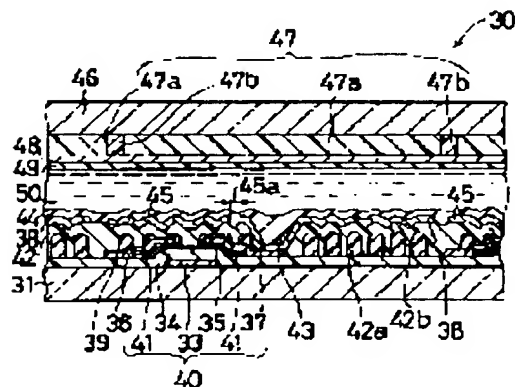
(72)Inventor : KANBE MAKOTO  
MITSUI SEIICHI

## (54) REFLECTION TYPE LIQUID CRYSTAL DISPLAY DEVICE

(57)Abstract:

PURPOSE: To improve the display quality of a reflection type liquid crystal display device.

CONSTITUTION: A gate bus line, a source bus line and a TFT 40 are formed on a substrate 31, and an organic insulating film 42 provided with a projecting part 42b is formed thereon. A light shielding film 45 is formed on the surface of the organic insulating film and within an area above the TFT 40, a counter electrode 38 is formed in an area except the above-mentioned area. A gap 45a is open in between the counter electrode 38 and the light shielding film 45. Further, an oriented film 44 is formed thereon, and the oriented film 44 and the substrate 46 where a color filter 47, an electrode 48 and an oriented film 49 are



formed are stuck together with liquid crystal 50 interposed.

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LEGAL STATUS

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# PATENT ABSTRACTS OF JAPAN

(11)Publication number : **11-052110**

(43)Date of publication of application : **26.02.1999**

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(51)Int.Cl.

G02B 5/08

G02B 5/02

G02B 5/10

G02F 1/1335

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(21)Application number : **09-203637**

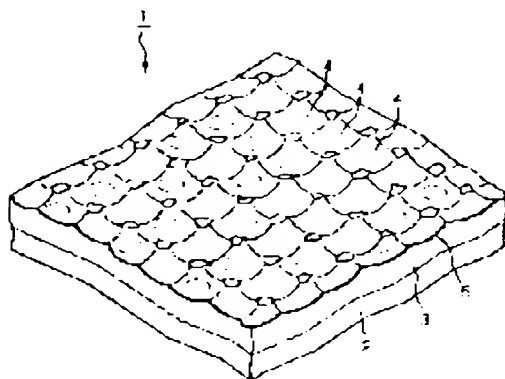
(71)Applicant : **ALPS ELECTRIC CO LTD**

(22)Date of filing : **29.07.1997**

(72)Inventor : **TAKATSUKA TOMOMASA**  
**UMAGAMI KOICHI**  
**OKITA MASAO**

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(54) **REFLECTION BODY AND REFLECTION TYPE LIQUID CRYSTAL DISPLAY  
DEVICE**



(57)Abstract:

PROBLEM TO BE SOLVED: To provide a reflection body capable of obtaining the high reflection efficiency over a wide angle and to provide a reflection type liquid crystal display device whose visual angle is wide even in every direction and which has a brighter display surface.

SOLUTION: Many recessed part 4 whose inner surfaces are one part of sphericities are continuously formed on the surface of a reflection body 1. Then, depths of respective recessed parts 4 are formed at random within the range of 0.1 to 3  $\mu\text{m}$  and pitches among adjacent recessed parts 4 are arranged at random within the range of 5 to 50  $\mu\text{m}$  and inclinations of inner surfaces of the recessed parts 4 are set within

the range of -18 to 18 degrees. Moreover, the reflection type liquid crystal display device is provided with this reflection body 1.

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## LEGAL STATUS

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# PATENT ABSTRACTS OF JAPAN

(11)Publication number : **11-242105**

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B29C 33/38

B29C 33/42

G02B 5/02

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(21)Application number : **10-042597**

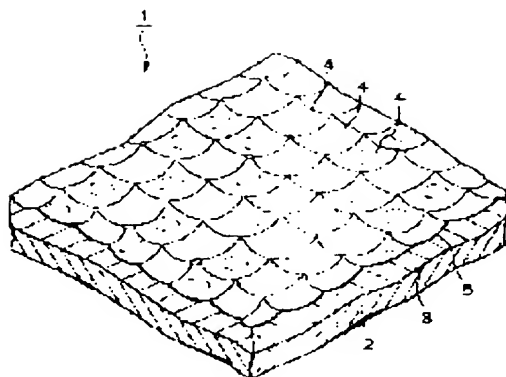
(71)Applicant : **ALPS ELECTRIC CO LTD**

(22)Date of filing : **24.02.1998**

(72)Inventor : **TAKATSUKA TOMOMASA**  
**MORIIKE TATSUYA**  
**UMAGAMI KOICHI**  
**KANO MITSURU**

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**(54) MATRIX FOR FORMING REFLECTOR AND ITS PRODUCTION AND REFLECTOR  
AND ITS PRODUCTION AS WELL AS REFLECTION TYPE LIQUID CRYSTAL DISPLAY  
DEVICE**



(57)Abstract:

PROBLEM TO BE SOLVED: To provide a reflector with which high reflection efficiency is obtainable over a wide angle and is brighter and whiter than heretofore.

SOLUTION: A presser is pressed to the surface of a base material for a matrix and the pressing is repeated while the position of the pressure on the surface of the base material for the matrix is changed, by which many recessed parts having their inside surfaces constituting part of spherical surfaces are continuously formed on the mold surface of the base material for the matrix. Such base material is formed as the matrix for forming the reflector. A transfer mold having the mold surface reversing the rugged shapes of the mold surface of such matrix is formed and the mold surface of the

transfer mold is transferred to the surface of the base material for the reflector. The reflector 1 is thus formed. The depth of the recessed parts 4 of the reflector 1 is formed to a range of 0.6 to 1.2  $\mu\text{m}$ , the inclination angle distribution on the inside surface of the recessed parts 4 to  $-8$  to  $+8^\circ$  and the pitch of the adjacent recessed parts 4 to 26.5 to 33.5  $\mu\text{m}$ .

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H01L 31/052

H01L 31/04

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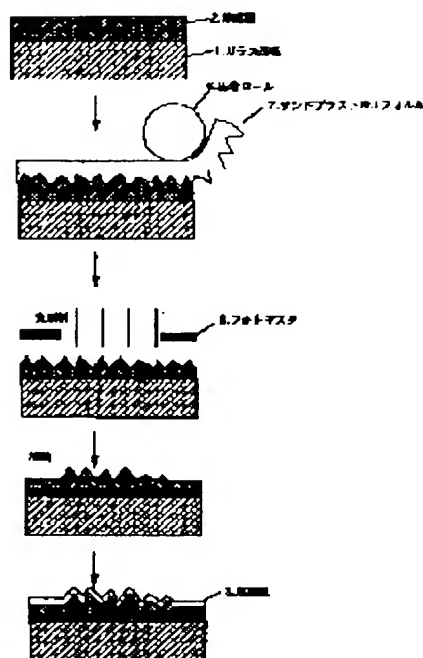
(71)Applicant : **HITACHI CHEM CO LTD**

(22)Date of filing : **08.03.1999**

(72)Inventor : **TAKANE NOBUAKI**  
**YOSHIDA TAKESHI**  
**TSURUOKA YASUO**  
**KIZAWA KEIKO**

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(54) **PRODUCTION OF DIFFUSION REFLECTION PLATE AND TRANSFER FILM**



(57)Abstract:

PROBLEM TO BE SOLVED: To make it possible to efficiently produce a diffusion reflection plate used for diffusion reflection of a reflection type LCD, etc., by forming ruggedness on a thin-film layer, photosetting the thin-film layer in apertures by using a photomask to hold a rugged shape, fluidizing the thin-film layer of uncured portions by heating to smooth the layer and forming a reflection film on the surface formed with the thin-film layer.

SOLUTION: The thin-film layer 2 is formed on the surface desired to be formed with the ruggedness of a glass substrate 1 and a sandblasted PET film 7 subjected to a processing treatment to a state of the surface having a multiplicity of the fine ruggedness is

pressed to the thin-film layer 2. The film is exposed with the photomask 8 formed with the portions desired to hold the ruggedness as the apertures and is heated, by which the smoothed portions are smoothed. As a result, the thin-film layer 2 which has a multiplicity of the fine ruggedness in the desired portions and is smoothed in the required portions is formed at a low cost by the stage simpler than the method of patterning by a photolithography process. If the reflection film 3, such as a metallic thin film, is formed thereon, the diffusion reflection plate is obtained.

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